Report on the Vermont Clean Energy Development Fund

Vermont Department of Public Service

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Purpose of this report

This report will provide background information on the establishment of the VERMONT CLEAN ENERGY DEVELOPMENT FUND; propose guiding principles and program design; and make recommendations for the distribution of $1.3 million in funds prior to December 1, 2006. This report will also set the foundation for a five-year strategic plan and will be distributed for public comment. The recommendations included in this report will be submitted to the Advisory Committee for their approval.

Establishment of the Vermont Clean Energy Development Fund

In 2005, the Vermont General Assembly established the VERMONT CLEAN ENERGY DEVELOPMENT FUND through ACT 74 – AN ACT AUTHORIZING VERMONT YANKEE TO GO BEFORE THE PUBLIC SERVICE BOARD TO SEEK PERMISSION FOR DRY CASK STORAGE. Section 6523 of the ACT specifies that a VERMONT CLEAN ENERGY DEVELOPMENT FUND will be established and funded through proceeds due to the state under the terms of two memoranda of understanding between the Vermont Department of Public Service (DPS) and Entergy Nuclear VT and Entergy Nuclear Operations, Inc., and by any other monies that may be appropriated to or deposited into the Fund.

The purpose of the VERMONT CLEAN ENERGY DEVELOPMENT FUND is to promote the development and deployment of cost-effective and environmentally sustainable electric power resources – primarily with respect to renewable energy resources, and the use of combined heat and power technologies - for the long-term benefit of Vermont electric customers. ACT 74 specifies that the Fund shall be managed to promote:

- The increased use of renewably produced electrical, thermal energy, and combined heat and power technologies in the state;
- The growth of the renewable energy-provider and combined heat and power industries in the state;
- The creation of additional employment opportunities and other economic development benefits in the state through the increased use of renewable energy and combined heat and power technologies;
- The stimulation of increased public and private sector investment in renewable energy and combined heat and power related enterprises, institutions, and projects in the state.

ACT 74 defines “clean energy resources” as electric power supply and demand-side resources that are either combined heat and power facilities, cost-effective energy efficiency resources, or renewable energy resources. Renewable energy includes the following: solar photovoltaic and solar thermal energy; wind energy; geothermal heat

pumps; farm, landfill, and sewer methane recovery; low emission, advance biomass power, and combined heat and power technologies using biomass fuels such as wood, agricultural or food wastes, energy crops, and organic refuse-derived waste, but not municipal solid waste; advanced biomass heating technologies and technologies using biomass-derived liquid fuels such as biodiesel.

Guiding Principles of the Vermont Clean Energy Development Fund

In light of the intent of the General Assembly expressed through ACT 74, the DPS proposes the following guiding principles for the VERMONT CLEAN ENERGY DEVELOPMENT FUND (CEDF):

1. Support diversified portfolio of clean energy technologies that will benefit ratepayers, leverage private investment, and have positive impacts in terms of economic development, additional employment opportunities, and environmental attributes.

2. Seek to remove market barriers related to the development and deployment of renewable energy and combined heat and power technologies in Vermont;

3. Ensure maximum value from the CEDF funding by supporting initiatives and activities that are reliable, cost effective, and utilize commercialized or nearly commercialized technologies.

Organization, Management and Governance

DPS ADMINISTRATION

In accordance with ACT 74, the CEDF shall be administered by the DPS. The DPS has extensive experience with issuing proposal solicitations and administering grants. The DPS also works with Vermont's ratepayers, power suppliers, and other stakeholders and interested parties on a regular basis. A Fund Administrator will be designated to have primary oversight of the Fund including writing and issuing Requests for Proposal, managing grant agreements, preparing annual reports, and disseminating information on the Fund.

In addition to the DPS Fund Administrator, an Advisory Committee and Investment Committee will be established to provide guidance on program development and funding decisions.

ADVISORY COMMITTEE

The role of the Advisory Committee will be to review the overall Fund program design, which will include a five-year strategic plan, and the annual program plan and operating

budget developed by the DPS Commissioner. As defined in Sec. 5, 10 V.S.A § 6523, the Advisory Committee will consist of the Commissioner of Public Service or a designee, and the Chairs of the House and Senate Committees on Natural Resources and Energy or their designees.

INVESTMENT COMMITTEE

The Investment Committee will approve the CEDF plans, budget and programs designs. The Investment Committee will also assist the Fund Administrator and the DPS Commissioner in the review of grants and investments; determining the viability of a project, company, product or service; and evaluating marketing and business plans. It is recommended that the Advisory Committee and Investment Committee give the Fund Administrator discretion to fund lower cost projects that fall under a pre-determined amount. As defined in Sec. 5, 10 V.S.A § 6523, the Investment Committee shall consist of seven persons appointed by the Advisory Committee.

MANAGEMENT OF THE FUNDS

The DPS proposes that the State Treasurers Office be charged with managing the investment portfolio for the Fund and the Vermont Economic Development Authority (VEDA) manage the loan processing.

PUBLIC INPUT PROCESS

The DPS will initiate a public input process to receive feedback on the proposed CEDF program design, five-year strategic plan, and annual program plan. The DPS will at minimum hold one public hearing and post draft documents on the department website. This outreach and feedback process will ensure that the ultimate structure and administration of the Fund has the buy-in from interested parties and stakeholders.

Funding Mechanisms

The DPS suggest that grants, loans, equity investments, and direct incentive payments be utilized for distributing funds. This may include incentives to directly subsidize clean energy installations or business development grants and loans to build clean energy generation and production facilities and infrastructure.

Funding Criteria

Before committing to any expenditure, the Fund Administrator and the Investment Committee will ensure that all potential programs and projects are rigorously evaluated to increase the likelihood that the resources are allocated in a fair and cost-effective manner. Specific program and project evaluation criteria are more completely described below.

Financial Leverage

To maximize use of the available funds, the degree of financial leverage (through funding obtained from the federal government, private investors, companies and consumers) will be a component of investment decisions.

Sustainability

Programs and projects will be evaluated in terms of the degree to which they are likely to be sustainable over time both in terms of economics and operation.

Market Impact

The Fund will be used to meet the existing demand for renewable energy, reduce barriers to market entry, and to create new markets in Vermont.

Economic Impact

The extent of the additional economic value created by support of a project/program will be evaluated.

Public Benefit

Projects will be evaluated in regards to the benefit to Vermont ratepayers and/or system benefits. Projects that benefit public buildings and/or will be located in constrained areas may receive preference in the evaluation process.

Initial Targeted Uses for the Fund

The DPS proposes that the following technologies and initiatives be funded with the initial $1.3 million that has been authorized for spending prior to December 1, 2006.

SOLAR AND SMALL WIND INCENTIVE PROGRAM

The DPS proposes that some of the initial funds be distributed through the *Vermont Solar and Small Wind Incentive Program*. This Program was originally established by Act 69, which was passed by the Vermont State Legislature during the spring of 2003, and signed into law by Governor Douglas in June 2003. The program provides direct incentives to residential, commercial, and municipalities to reduce the costs of installing solar electric, small wind, and solar hot water systems. The initial program provided $840,000 to fund the installation of over 200 renewable energy systems and was fully subscribed by August 2004. The second round of the incentive program started on September 1, 2005 with $830,450 of additional incentive funding. By the end of October, 2005 all of the incentives from the second round of funding for support of solar hot water and solar electric system were reserved. Due to the proven success of this

program the DPS recommends that $500,000 of the initial funds be immediately allocated to the *Vermont Solar and Small Wind Incentive Program*.

COMBINED HEAT AND POWER (CHP)/DISTRIBUTED GENERATION (DG)

CHP can be an efficient, clean and reliable approach to generating power and thermal energy that provides numerous benefits to energy users, the environment, and the electric grid. In a globally competitive world where our employers are facing stiff cost competition, the economic benefit of reducing a facility's fuel and/or electricity costs is important to maintaining our economic prosperity. CHP can decrease the impact of grid power outages and can help reduce grid congestion by reducing load in areas of high demand.

CHP/DG applications can be utilized in a wide variety of facilities, including:

Industrial Manufacturers – chemical, refining, ethanol, pulp and paper, food processing, glass manufacturing.

Institutions – colleges and universities, hospitals, prisons.

Commercial Buildings – hotels, airports, high-tech campuses, large office buildings, nursing homes.

Municipal – district energy systems, wastewater treatment facilities, landfills, K-12 schools.

Residential – multi-family housing, planned communities

The North Country Hospital is an example of a successful CHP system that has recently been installed in Vermont. North Country Hospital has been receiving national attention for its gasifier system that uses wood chips to generate heat and electricity. The wood chips cost the hospital about $18/ton, with one ton of chips equivalent to 117 gallons of oil. The CHP technology has resulted in huge cost savings for the hospital, anticipated to be as high as $328,000 annually. If the hospital had not been able to reduce its heating and electrical costs, the costs would have been passed on to patients in the form of an increase in the cost of providing medical care.

The up-front capital cost can be a barrier to increased CHP deployment, as commercial and industrial customers often have to focus their resources on their core businesses. The DPS proposes that $50,000 of the first round of funding be used to support an additional CHP facility in Vermont.

BIOMASS

Biomass is any organic matter, which is available on a renewable basis through natural processes or as a by-product of human activity. Biomass includes: agricultural crops

and wastes, wood and wood waste, energy crops, and organic refuse-derived waste. Biomass resources can be converted into energy and liquid fuels through many different means such as combustion, gasification, fermentation, and anaerobic digestion.

There has been great success in Vermont in using wood for fuel in commercialized boilers, particularly in K-12 schools where 25 systems have been installed. The DPS proposes that $100,000 of the initial funds be allocated for the installation of a biomass system in a public building.

Animal wastes such as cow manure can be used to generate electricity through anaerobic digestion. The increased use of anaerobic digester technology in Vermont would not only provide a source of energy generation on farms, it also addresses odor control, and can mitigate run-off of pollutants into local waterways. One barrier to the use of anaerobic digestion is the lack of access by farms to three-phase power lines that are needed for economic, commercial electrical generation. The DPS proposes that $485,000 of the initial funds be used to attempt to overcome the three-phase power barrier. The DPS also recommends that future funds be allocated to continue the development of anaerobic digestion systems in Vermont. This is discussed in more detail in the section on “Future Funding”.

Other Projects

In accordance with Sec. 5, 10 V.S.A § 6523 funds will also be allocated for a DPS initiated public engagement process ($50,000) and for projects under the agricultural economic development special account established under 6 V.S.A. § 4710. The DPS proposes that $100,000 be allocated for the agricultural economic development special account. The Department also proposes an allocation of $15,000 for initial CEDF development, administration costs, and facilitation of the public hearing (s) related to the CEDF.

Future Funding

It is anticipated that the CEDF will fund a wide variety of technologies and programs. ACT 74 specifies that “clean energy resources” means electric power supply and demand-side resources that are either combined heat and power facilities, cost-effective energy efficiency resources, or renewable energy resources. Renewable energy includes the following: solar photovoltaic and solar thermal energy; wind energy; geothermal heat pumps; farm, landfill, and sewer methane recovery; low emission, advance biomass power, and combined heat and power technologies using biomass fuels such as wood, agricultural or food wastes, energy crops, and organic refuse-derived waste, but not municipal solid waste; advanced biomass heating technologies and technologies using biomass-derived liquid fuels such as biodiesel. The DPS also recommends including small hydroelectric projects.

The DPS recommends that at least once a year a Request for Proposals be issued to solicit proposals for a wide variety of clean energy projects. The DPS also recommends that loan programs be utilized for the distribution of funds to insure the long-term sustainability of the CEDF. In addition to continued funding in the areas included under the "Initial Targeted Uses for the Fund", the Department recommends consideration of the project areas discussed below.

BIOMASS

Animal/Organic Waste

Animal manure and other organic waste can be used to create energy through anaerobic digestion. Anaerobic Digestion systems have been installed at a number of Vermont farms, including Foster Brothers in Middlebury, Whitcomb Farm in Williston, Hinsdale Farm in Charlotte, and Blue Spruce Farm in Bridport. Studies have also been conducted that have looked at the potential for a central manure digester plant to service dairy farms in the Enosburg Falls area, and the feasibility of a cooperative dairy manure management project in St. Albans. However, anaerobic digestion systems haven't been installed on a broad basis because they require a substantial initial investment.

Great interest exists in the need to address barriers to the expansion of anaerobic digestion technologies on Vermont farms. Barriers to expansion of anaerobic digestion include not only the investment in technology, but also lack of access by farms to three phase power lines.

There is great demand and opportunity for expansion of anaerobic digester technology in Vermont, not only for renewable energy generation, but also to address manure management requirements for farms. The CEDF should be used as a vehicle to further utilize this technology in Vermont.

Biofuels

Biomass-derived liquid fuels such as biodiesel and ethanol are renewable, domestically produced, environmentally friendly alternatives to the use of fossil fuels. Increased use of biofuels can also decrease our dependence on foreign oil and strengthen our energy security. Instate production of biofuels would support local agriculture and the rural economy. Biofuels can be used for heating, transportation, and to generate electricity.

Biodiesel can be made from plant oils from crops such as soybeans, canola, and rapeseed; and from waste vegetable oils and animal fats.

Ethanol is an alcohol made through the fermentation of plant sugars from agricultural crops and biomass resources. Most ethanol produced in the U.S. is made from corn. However, there are currently 14 ethanol production facilities that use other feedstocks

such as cheese whey, beverage and beer waste, and potato waste. These are typically much smaller facilities compared to corn-to-ethanol facilities.

The Department recommends that the CEDF Advisory Committee consider funding further development of biofuel production and infrastructure in Vermont.

Wood

There has been great success in Vermont in using wood in commercialized boilers. The DPS proposes that consideration be given to allocating funds for the installation of additional biomass systems with a particular focus on publicly owned buildings. The potential for centralized-district heating should also be explored.

SOLAR AND SMALL WIND

Solar energy is an abundant resource that can be used to generate electricity and provide hot water. Solar photovoltaics (PV), which convert sunlight directly into electricity, have significant application potential, particularly in the commercial sector. A recent report by the Peregrine Energy Group and the Clean Energy Group highlights the public policy benefits of using funds to support the installation of PV in affordable multi-family housing, including how the technology can mitigate rising housing operation costs. The DPS envisions offering incentives for the placement of solar panels on commercial buildings to not only provide a clean energy alternative, but to help shave peak demand on the grid during summer months.

Small-scale wind turbines generate energy that is emissions-free and use a relatively small amount of space so they are compatible with many existing land uses. Small-scale net-metered wind turbine systems are connected to the electric grid and lower electricity demand from the electric utility. Net-metered wind turbines are smaller (in terms of tower height, rotor diameter, and amount of energy generated) than commercial wind turbines. Due to the current high costs for small-scale wind turbines it is unlikely that there will be significant installment of systems without financial incentives.

The DPS recommends that further development of solar and small wind projects be supported through continued funding of the *Vermont Solar and Small Wind Incentive Program*. The Department also recommends exploring redesigning this program in the future to potentially include larger PV installations, focusing more on publicly owned buildings and/or low-income multi-family housing, and transitioning from a incentive/grant program to a loan program.

ENERGY EFFICIENCY

Vermont is a national leader in energy efficiency programs, partially due to the creation of the state Energy Efficiency Utility-Efficiency Vermont. Efficiency Vermont (EVT) is the nation's first statewide provider of energy efficiency services. EVT provides

technical advice, financial assistance and design guidance to help make Vermont homes, farms and businesses more energy efficient. Due to the availability of this resource in Vermont, the DPS does not recommend that the CEDF focus on energy efficiency initiatives. However, there are areas of energy efficiency that the Department would encourage the Advisory Committee to consider for funding assistance.

High Performance Buildings

One such area is the further development of high performance buildings in Vermont. A high-performance building has superior energy, economic, and environmental performance over buildings, which are built using standard practices. High performance building design considers the site/location, energy use, materials, indoor air quality, and acoustics; and how all of these things relate to each other. The DPS recommends that funds be allocated for the design and/or construction of high performance buildings with a focus on publicly owned buildings.

Performance Contracting

Another area that the DPS would recommend receiving funding support in the future is Performance Contracting. By entering into performance-based contracts, schools, municipalities, and other entities can reduce their energy costs through energy efficiency improvements, with annual cost savings "guaranteed" by the contractor. The cost savings are then used to pay for the energy efficiency installations.

Despite the obvious positive outcomes associated with performance-based contracting there is currently very few schools or municipalities considering performance contracting. To encourage more widespread use of performance contracting the DPS proposes that CEDF funds be used to provide information and technical assistance on performance contracting to schools and municipalities.

Next Steps

This report is presented for review by the general public and the CEDF Advisory Committee. The program design suggestions included in this report will lay the foundation for a five-year strategic plan to be submitted to the Advisory and Investment Committees for approval. The DPS looks forward to receiving feedback from stakeholders and general public as the process to create and implement the VERMONT CLEAN ENERGY DEVELOPMENT FUND continues.